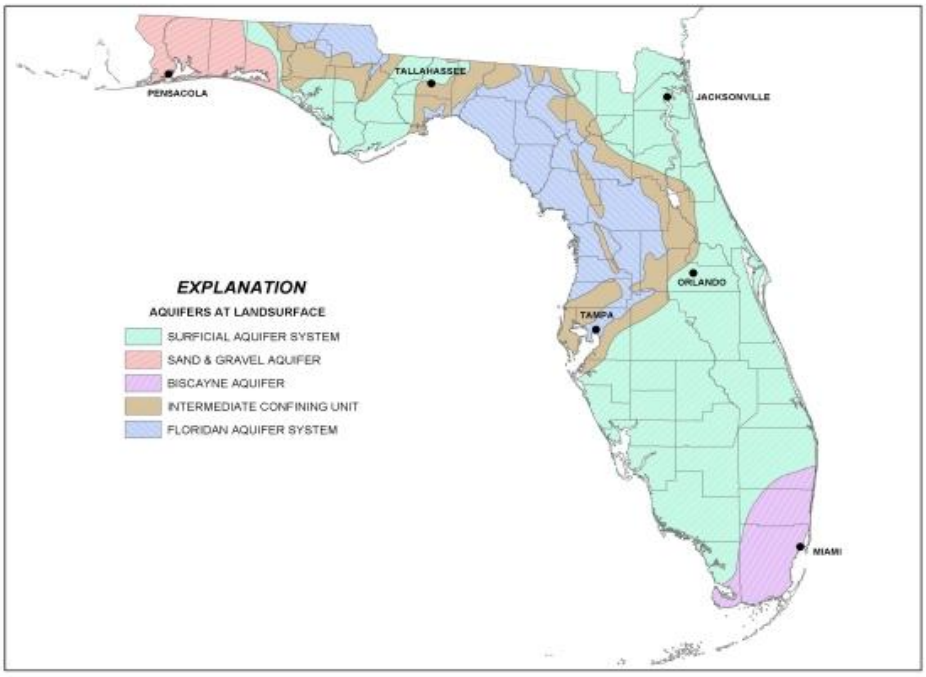
St Lucie County Water Source: Surficial Aquifer

The surficial aquifer system in Florida includes any otherwise undefined aquifers that are present at land surface. Unlike the sand and gravel aquifer and the Biscayne aquifer, which supply water to large municipalities, the surficial aquifer is mainly used for domestic, commercial, or small municipal supplies. The aquifer thickness is typically less than 50 feet but can range up to 400 feet in Indian River and St. Lucie Counties. Groundwater in the surficial aquifer generally flows from areas of higher elevation towards the coast or streams where it can discharge as base flow. Water enters the aquifer from rainfall and exits as base flow to streams, discharge to the coast, evaportranspiration, and downward recharge to deeper aquifers.



Source: www.dep.state.fl.us/swapp/aquifer.asp

Water Treatment

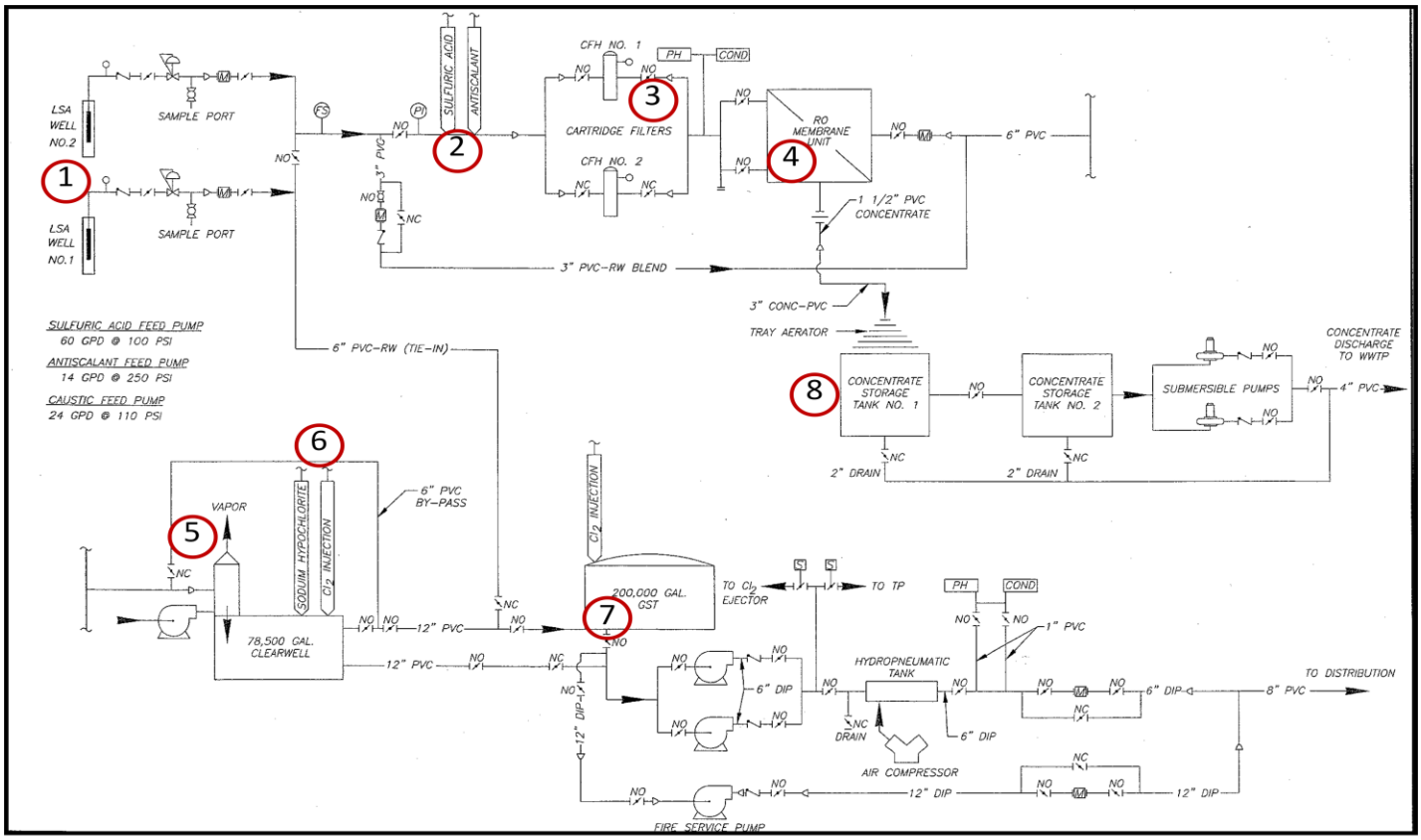
At the Holiday Pines Water Treatment Plant, the operators determine customer demand and activate surficial wells needed to meet that demand. The well water goes through the Reverse Osmosis cycle.

The Holiday Pines Water Treatment Plant currently utilizes the low pressure reverse osmosis (LPRO) process to remove monovalent ions, such as chloride and sodium; soften the water; and reduce dissolved organic carbon content (disinfection byproduct precursors and color). The current membrane production capacity of the Holiday Pines Water Treatment Plant is 0.250 mgd with an additional 0.038 mgd for raw water blending for a total finished water production capacity of 0.288 mgd.

Figure 1 provides a simplified process flow diagram for the existing plant. Raw waste supplied from the lower surficial aquifer (LSA) wells [1] is pretreated with sulfuric acid [2] for acidification, scale inhibitor, and filtered through 5-micron cartridge filters. There are currently two cartridge filter housings [3] in service in the process building.

After cartridge filtration, the feed water is sent to the membrane feed booster pumps [4]. Two booster pumps are currently available to pressurize the membrane skid. Both feed pumps draw from a common suction manifold.

After membrane treatment, the membrane permeate water is blended with raw water and goes to a degasifier [5], which is located on top of the clearwell, for the removal of hydrogen sulfide and carbon dioxide. Off-gas from the degasifier is emitted into the atmosphere. Water from the degasifier falls directly into the clearwell, where gaseous chlorine [6] is added for primary disinfection and sodium hydroxide for PH control. The membrane concentrate [7] is aerated and pumped to the Holiday Pines Wastewater Treatment Plant. Disinfected water is subsequently transferred to the ground storage tank (GST) [8] via gravity and is delivered to the customer on demand.



February 18, 2010

Figure No. 1
Holiday Pines Water Treatment Plant
St. Lucie County, Florida
Process Flow Diagram